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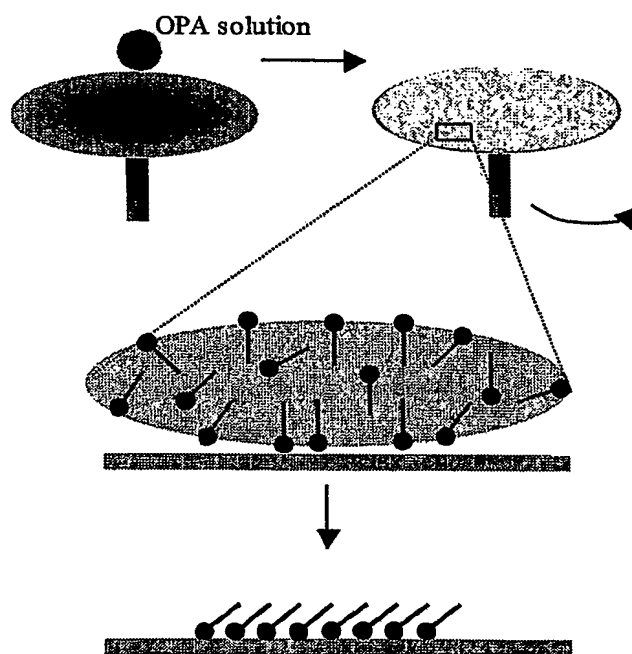
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(54) Title: METHOD OF CONTROLLABLE MORPHOLOGY OF SELF-ASSEMBLED MONOLAYERS ON SUBSTRATES



(57) Abstract: Method of controlling the morphology of self-assembled monolayers (SAMS) on substrates having hydrophilic surfaces. The hydrophilic surface is exposed to a fluid having a mixture of molecules which can self-assemble on the hydrophilic surface and hydrophobic molecules for a sufficient length of time so that the molecules which can self-assemble on the hydrophilic surface form a complete self-assembled monolayer. In a particular embodiment octadecylphosphonic acid (OPA) molecules have been self-assembled on oxidized substrates including but not limited to mica, silicon, sapphire, quartz and aluminum by spin-coating a solution containing the octadecylphosphonic acid (OPA) molecules and hydrophobic molecules such as chloroform or trichloroethylene under a controlled relative humidity. Control of the morphology of OPA SAMs is affected by adjusting humidity and the duration of spin-coating. Atomic force microscopy revealed that relative humidity has a profound influence on the morphology of the OPA SAMs formed. When sufficient molecules are applied either consecutively or separately, the final morphology will be a complete monolayer, regardless of the relative humidity.